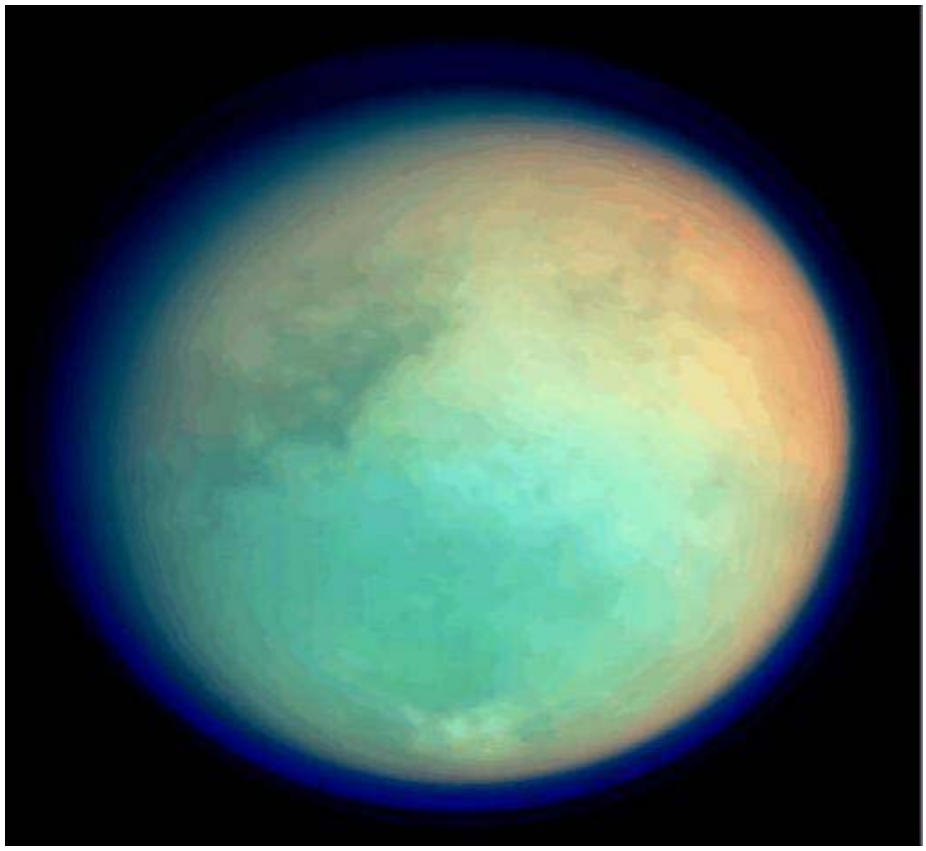
C A S S I N I



T I T A N 029TI(T18)
MISSION DESCRIPTION

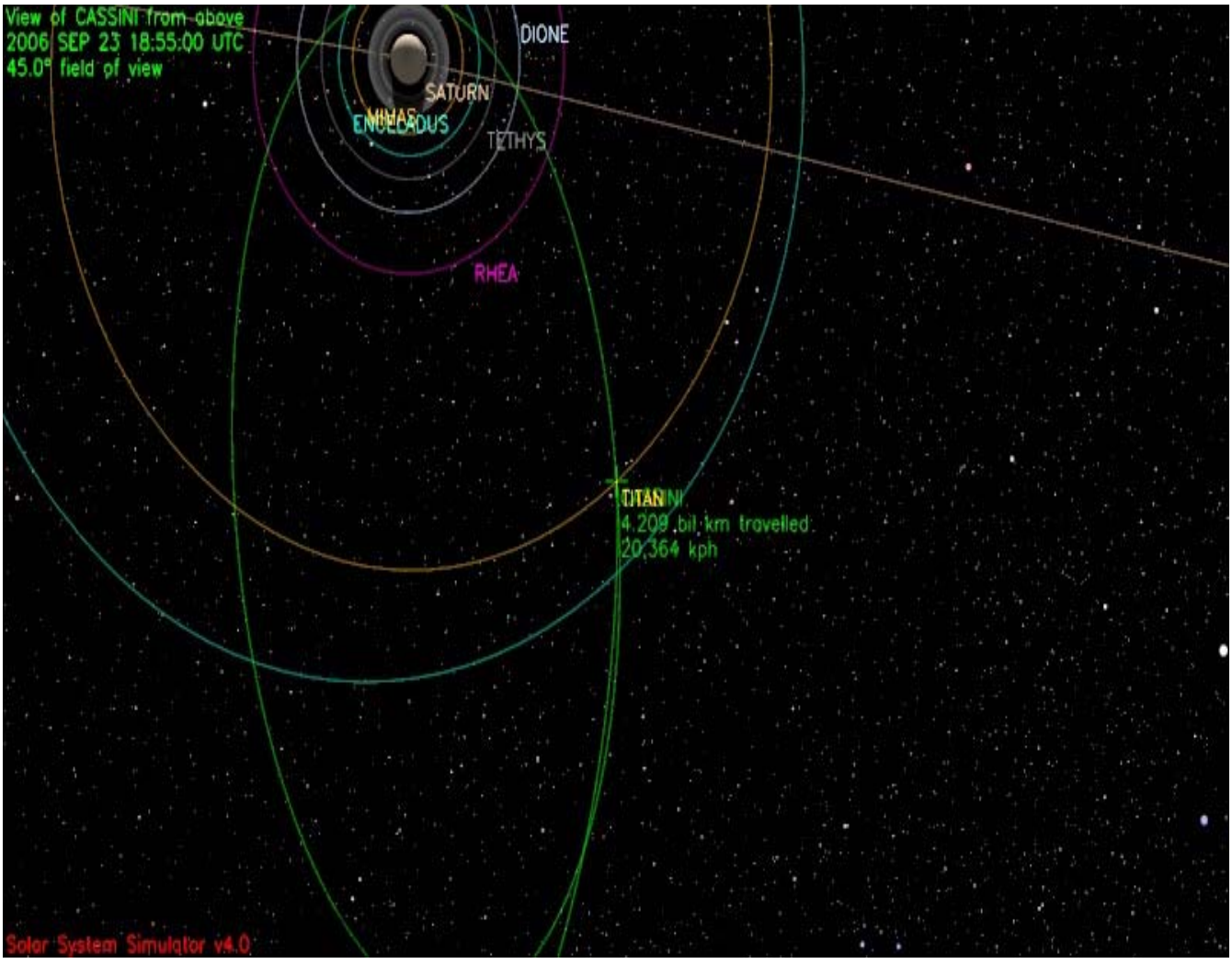
September 2006

Jet Propulsion Laboratory
California Institute of Technology

1.0 OVERVIEW

Only 16 days after Titan-17, Cassini returns to Titan for its nineteenth targeted encounter. The closest approach to Titan occurs on Saturday, September 23, at 18:59 spacecraft time (1:21 p.m. Pacific Time) at an altitude of 960 kilometers (600 miles) above the surface and at a speed of 5.8 kilometers per second (12,977 mph). The latitude at closest approach is 71°, and the encounter occurs on orbit number 29.

This encounter is set up with two maneuvers: an apoapsis maneuver on Sept 14 and an approach maneuver, scheduled for Sept 20. This inbound encounter occurs about 2 days before Saturn closest approach.



1.1 ABOUT TITAN

If Titan were in orbit around the Sun, it would likely stand out as the most important object in the solar system for humans to explore. Titan, the size of a terrestrial planet, has a dense atmosphere of nitrogen and methane and a surface covered with organic material. It is Titan that is arguably Earth's sister world and the Cassini-Huygens mission considers Titan among its highest priorities.

Although it is far colder and lacks liquid water, the chemical composition of Titan's atmosphere resembles that of early Earth. This, along with the organic chemistry that takes place in Titan's atmosphere, prompts scientists to believe that Titan could provide a laboratory for seeking insight into the origins of life on Earth. Data from the Huygens probe, which touched down on Titan's surface in January 2005, and the Cassini orbiter has shown that many of the processes that occur on Earth also apparently take place on Titan – wind, rain, volcanism, tectonic activity, as well as river channels, and drainage patterns all seem to contribute in shaping Titan's surface. However, at an inhospitable -290 ^{0}F (-179 ^{0}C), the chemistry that drives these processes is fundamentally different from Earth's. For example it is methane that performs many of the same functions on Titan that water does on Earth.

The Huygens probe landed near a bright region now called Adiri, and it photographed light hills with dark river beds that empty into a dark plain. It was believed that this dark plain could be a lake or at least a muddy material, but it is now known that Huygens landed in the dark region, and it is solid. Scientists believe it only rains occasionally on Titan, but the rains are extremely fierce when they come.

Only a small number of impact craters have been discovered. This suggests that Titan's surface is constantly being resurfaced by a fluid mixture of water and possibly ammonia, believed to be expelled from volcanoes and hot springs. Some surface features, such as lobate flows, appear to be volcanic structures. Volcanism is now believed to be a significant source of methane in Titan's atmosphere. However, there are no oceans of hydrocarbons as previously hypothesized. Dunes cover large areas of the surface.

The Cassini-Huygens mission, using wavelengths ranging from ultraviolet to radio, is methodically and consistently revealing Titan and answering long-held questions regarding Titan's interior, surface, atmosphere, and the complex interaction with Saturn's magnetosphere. While many pieces of the puzzle are yet to be found, with each Titan flyby comes a new data set that furthers our understanding of this world as we attempt to constrain scenarios for the formation and evolution of Titan and its atmosphere.

1.2 TITAN-18 SCIENCE HIGHLIGHTS

CIRS - Vertical sounding of stratospheric compounds on Titan, including H_2O. CIRS will also obtain information on trace constituents.

INMS – Determine atmospheric and ionospheric composition and thermal structure.

INMS will see the transition from co-rotating to thermal particles, down through the ionospheric peak. They will measure neutrals inbound and neutrals and ions outbound.

VIMS - Nested mapping, high, medium and global resolution.

RADAR - High resolution SAR ride along of Titan with INMS.

RPWS - Thermal plasma density and temperature measurements with the Langmuir probe, search for lightning and other radio emissions, characterization of plasma wave spectrum, search for evidence of pickup ions.

MIMI - Investigate micro-scale and near aspects of the Titan interaction by observing during about one hour period around an encounter. Also, measure Titan exosphere/magnetosphere interaction by imaging in ENA with INCA.

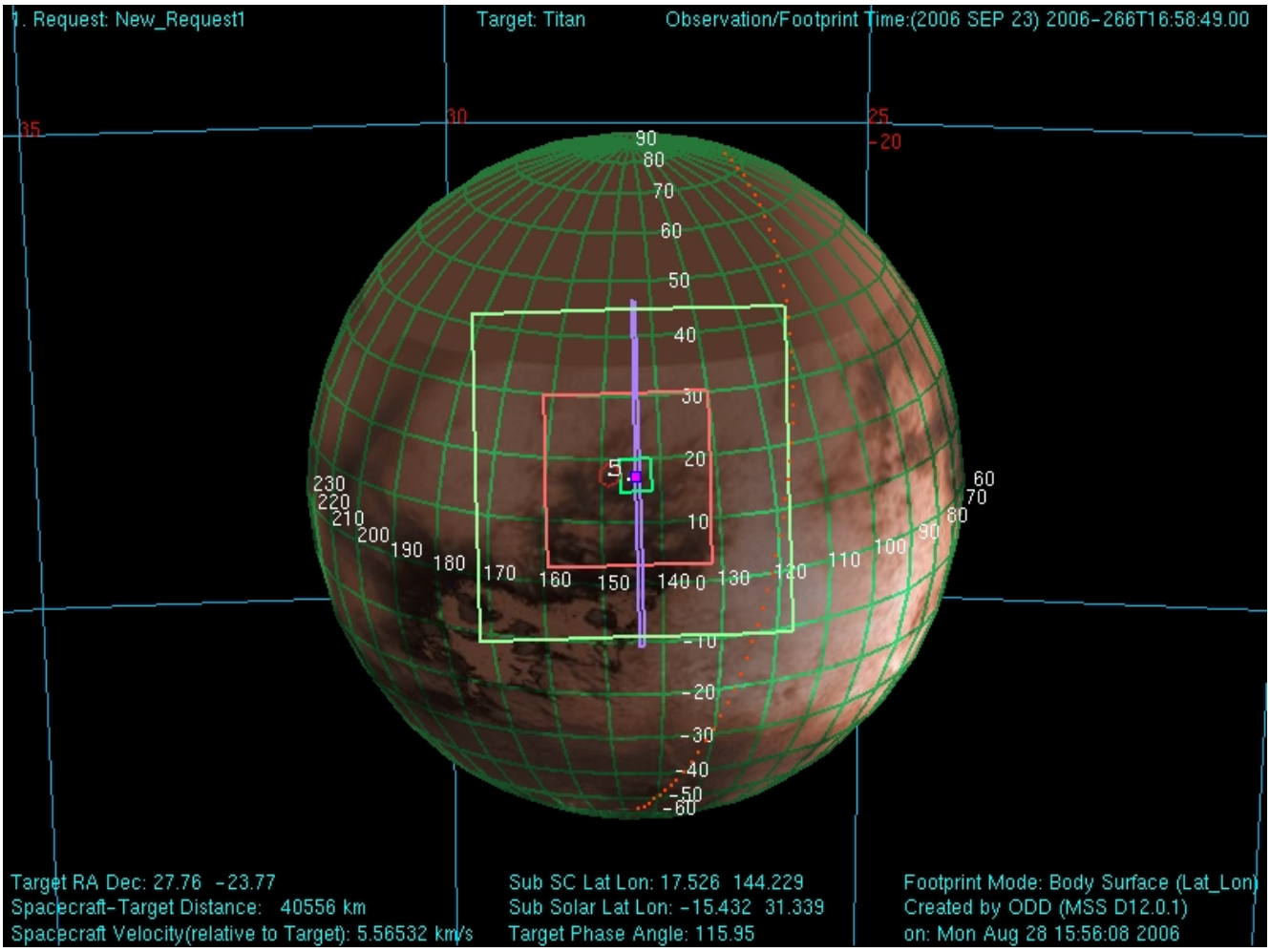
MAPS in general - Observations of Titan's interaction with Saturn's magnetosphere.

1.3 SAMPLE SNAPSHOTS

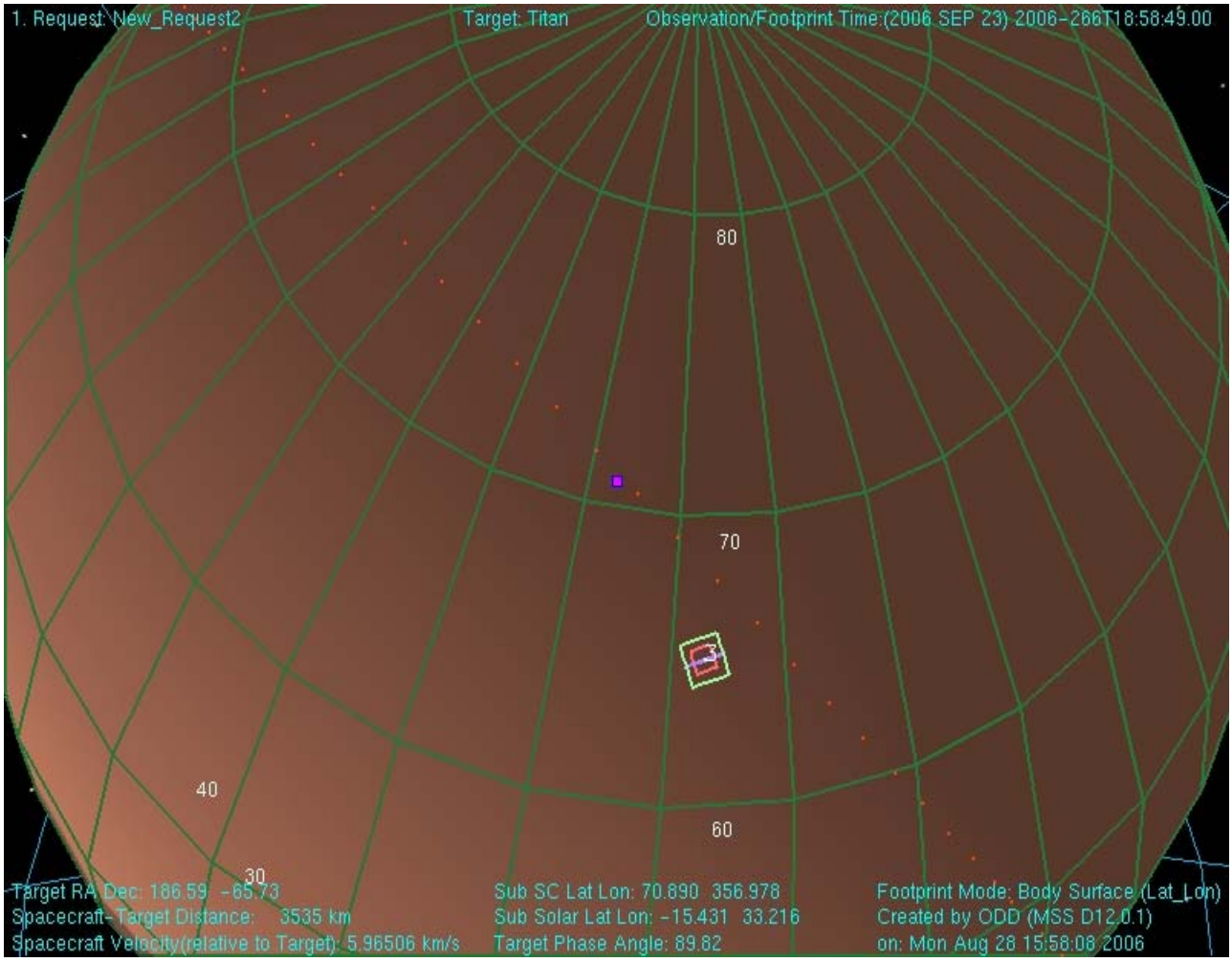
Three views of Titan from Cassini before, during, and after closest approach to Titan are shown below. The views are oriented such that the direction towards the top of the page is aligned with the Titan North Pole. The remote sensing instrument fields of view are shown in all three assuming they are pointed towards the center of Titan. The sizes of these fields of view vary as a function of the distance between Cassini and Titan. A key for use in identifying the instruments fields of view in the figures is listed at the top of the next page.

Key to ORS Instrument Fields of View in Figures

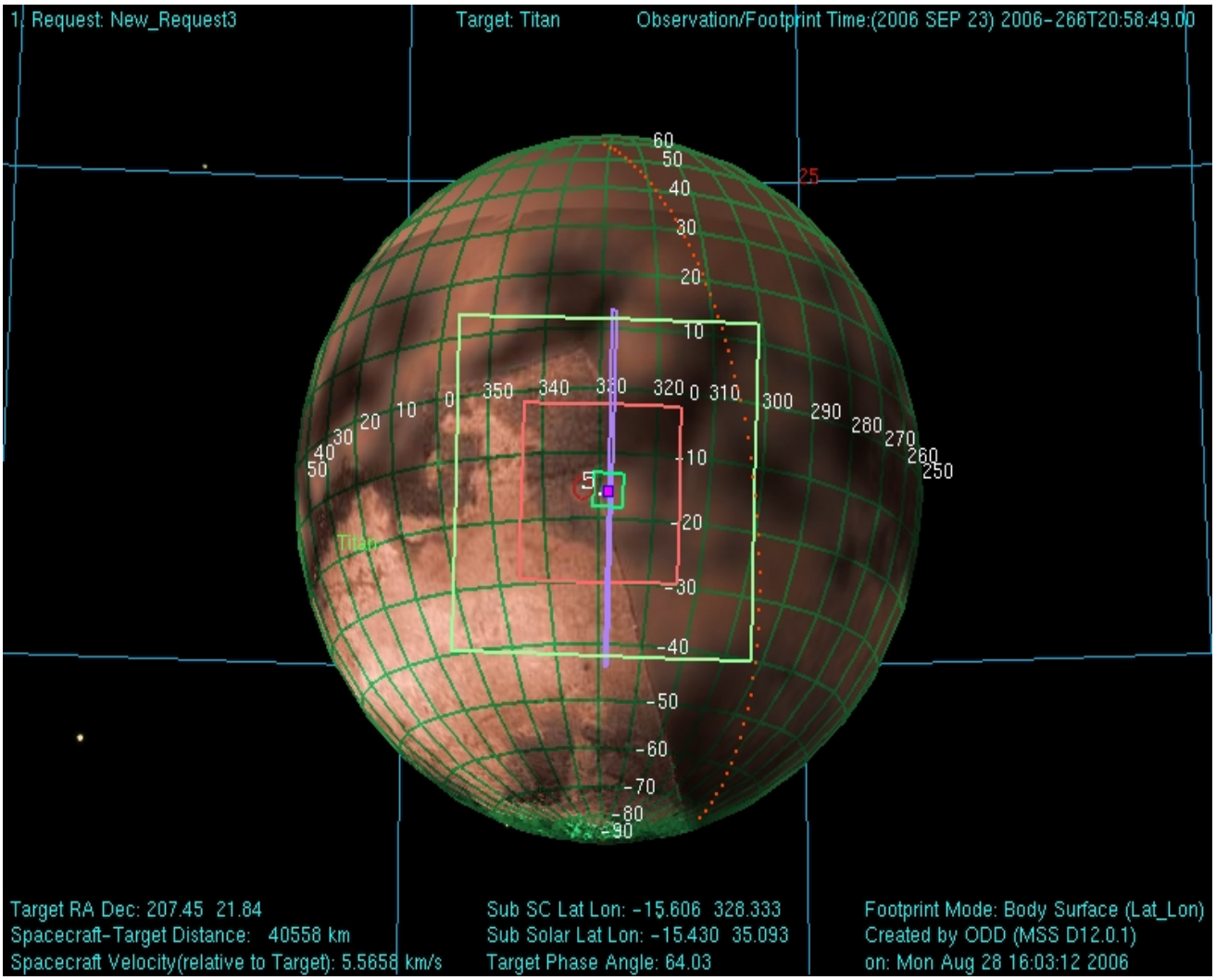
Instrument Field of View	Depiction in Figure
ISS WAC (imaging wide angle camera)	Largest square
VIMS (visual and infrared mapping spectrometer)	Next largest pink square
ISS NAC (imaging narrow angle camera)	Smallest green square
CIRS (composite infrared spectrometer) – Focal Plane 1	Small red circle near ISS_NAC FOV
UVIS (ultraviolet imaging spectrometer)	Vertical purple rectangle centered within largest square



View of Titan from Cassini 2 hours before Titan-18 closest approach



View of Titan from Cassini at Titan-18 closest approach



View of Titan from Cassini 2 hours after Titan-18 closest approach

Timeline and Geometry Table below

Cassini Titan-18 Timeline - September 2006

Colors: yellow = maneuvers; blue = geometry; pink = T18-related; green = data playbacks

Orbiter UTC	Ground UTC	Pacific Time	Time wrt T18	Activity	Description
263T10:32:00	Sep 20 11:54	Wed Sep 20 04:54 AM	T18-03d08h	**OTM #73 Prime**	Titan-18 minus 3 day targeting maneuver
263T20:22:00	Sep 20 21:44	Wed Sep 20 02:44 PM	T18-02d23h	Start of Sequence S24	Start of Sequence which contains Titan-18.
264T11:22:00	Sep 21 12:44	Thu Sep 21 05:44 AM	T18-02d08h	**OTM #73 Backup**	
265T20:07:00	Sep 22 21:29	Fri Sep 22 02:29 PM	T18-22h52m	Start of the TOST Segment	
265T20:07:00	Sep 22 21:29	Fri Sep 22 02:29 PM	T18-22h52m	Turn cameras to Titan	
265T20:37:00	Sep 22 21:59	Fri Sep 22 02:59 PM	T18-22h22m	Deadtime	Used to accommodate changes in flyby time
265T20:59:00	Sep 22 22:21	Fri Sep 22 03:21 PM	T18-22h00m	Infrared (IR) temperature & composition mapping	Obtain information on thermal structure & composition of atmosphere
266T03:59:00	Sep 23 05:21	Fri Sep 22 10:21 PM	T18-15h00m	Night imaging	Search for & monitor lightning and aurorae
266T04:59:00	Sep 23 06:21	Fri Sep 22 11:21 PM	T18-14h00m	Far IR limb observations	Obtain information on trace constituents in stratosphere
266T10:29:00	Sep 23 11:51	Sat Sep 23 04:51 AM	T18-08h30m	Wide-Angle Camera (WAC) photometry	Study properties & vertical distributions of particles
266T11:29:00	Sep 23 12:51	Sat Sep 23 05:51 AM	T18-07h30m	Ultraviolet imaging	Scan across visible hemisphere to form spectral images
266T15:59:00	Sep 23 17:21	Sat Sep 23 10:21 AM	T18-03h00m	Observations of Titan's interaction with Saturn's magnetosphere (through closest approach)	Thermal plasma density & temperature measurements; search lightning & other radio emmisions;characterization of plasma wave spectrum.
266T16:59:00	Sep 23 18:21	Sat Sep 23 11:21 AM	T18-02h00m	Far IR limb observations	Vertical sounding of stratospheric compounds (including H20)
266T18:13:00	Sep 23 19:35	Sat Sep 23 12:35 PM	T18-00h46m	Transition to thrusters	Continue observations through this 21 min transition
266T18:36:00	Sep 23 19:58	Sat Sep 23 12:58 PM	T18-00h23m	Ion & Neutral Mass Spectrometer (through closest approach)	Determine atmospheric & ionospheric thermal structure
266T18:49:00	Sep 23 20:11	Sat Sep 23 01:11 PM	T18-00h10m	**Titan Wake Crossing**	
266T18:59:00	Sep 23 20:21	Sat Sep 23 01:21 PM	T18+00h00m	**Titan-18 Flyby Closest Approach Time**	**Altitude = 960 km (600 miles), speed = 5.8 km/s (13,000 mph); 90 deg phase at closest approach**
266T19:22:00	Sep 23 20:44	Sat Sep 23 01:44 PM	T18+00h23m	**Transition back to reaction wheels (21 min)**	
266T19:45:00	Sep 23 21:07	Sat Sep 23 02:07 PM	T18+00h46m	IR Composition Mapping	High, medium, global resolution
267T04:52:00	Sep 24 06:14	Sat Sep 23 11:14 PM	T18+09h53m	Imaging in the visible	Study properties & vertical distributions of particles
267T06:45:00	Sep 24 08:07	Sun Sep 24 01:07 AM	T18+11h46m	Deadtime	Used to accommodate changes in flyby time
267T07:30	Sep 24 08:52	Sun Sep 24 01:52 AM	T18+12h31m	IR Observations of Saturn's rings	
267T10:10:00	Sep 24 11:32	Sun Sep 24 04:32 AM	T18+15h11m	Turn to Earth-Line	
267T10:30:00	Sep 24 11:52	Sun Sep 24 04:52 AM	T18+15h31m	Begin Playback of T18 Data	Goldstone 70M
267T20:00:00	Sep 24 21:22	Sun Sep 24 02:22 PM	T18+01d01h	End Playback of T18 Data	

OWLT (mins)	82
C/A Time	Sat Sep 23 01:21 PM

1.4 FLYBY GEOMETRY

Event Name: T18_29TI, Targeted Titan, Inbound. 050505 SPK: Table Creation Date (YYMMDD) 050712

Event Name at Event Time Only	SCET Date (YYYY-DOYTHH:MM:SS.FF) UTC	SCET Date (MM/DD/YYYY HH:MM:SS) UTC	SCET Date (MM/DD/YYYY HH:MM:SS) ET	Hours wrt Event Epoch	Minutes wrt Event Epoch	S/C Range (km)	S/C Altitude wrt Tri-axial Ellipsoid (km)	S/C North Latitude (deg)	S/C West Longitude SMEQPM Date (deg)	S/C Inertial Velocity (km/s)	S/C Radial Inertial Velocity (km/s)	S/C Tangential Inertial Velocity (km/s)	Central Body Angular Diameter (mrad)	Phase = Sun-Central_Body-S/C Angle (deg)	Sun-S/C-Central_Body Angle (deg)	S/C Local True Solar Time wrt Central Body (hh:mm)	Sub-solar Latitude wrt Central Body (deg)	Sub-solar West Longitude wrt Central Body SMEQPM Date (deg)
	2006-265T18:54:42.80	22-Sep-06	18:55:47	-24	-1440	486,823.6	484,248.6	12.3	125.9	5.755	-5.747	0.319	10.6	117.3	62.7	04.18	-15.4	10.6
	2006-265T22:54:42.80	22-Sep-06	22:55:47	-20	-1200	404,398.0	401,823.0	12.4	129.2	5.706	-5.701	0.241	12.7	116.9	63.1	04.20	-15.4	14.4
	2006-266T00:54:42.80	23-Sep-06	00:55:47	-18	-1080	363,430.5	360,855.5	12.5	130.8	5.682	-5.679	0.208	14.2	116.7	63.3	04.21	-15.4	16.3
	2006-266T02:54:42.80	23-Sep-06	02:55:47	-16	-960	322,624.4	320,049.4	12.7	132.5	5.659	-5.656	0.180	16.0	116.5	63.5	04.22	-15.4	18.1
	2006-266T04:54:42.80	23-Sep-06	04:55:47	-14	-840	281,974.9	279,399.9	12.8	134.2	5.637	-5.635	0.158	18.3	116.4	63.6	04.23	-15.4	20.0
	2006-266T06:54:42.80	23-Sep-06	06:55:47	-12	-720	241,474.6	238,899.6	13.0	135.9	5.617	-5.615	0.144	21.3	116.2	63.7	04.23	-15.4	21.9
	2006-266T08:54:42.80	23-Sep-06	08:55:47	-10	-600	201,112.3	198,537.3	13.2	137.6	5.599	-5.597	0.141	25.6	116.1	63.9	04.24	-15.4	23.8
	2006-266T10:54:42.80	23-Sep-06	10:55:47	-8	-480	160,872.8	158,297.8	13.5	139.4	5.583	-5.581	0.153	32.0	116.1	63.9	04.25	-15.4	25.6
	2006-266T12:54:42.80	23-Sep-06	12:55:47	-6	-360	120,735.6	118,160.6	14.0	141.1	5.572	-5.569	0.186	42.7	116.0	64.0	04.25	-15.4	27.5
	2006-266T13:54:42.80	23-Sep-06	13:55:47	-5	-300	100,697.1	98,122.1	14.3	141.9	5.568	-5.564	0.218	51.1	116.0	64.0	04.26	-15.4	28.5
	2006-266T14:54:42.80	23-Sep-06	14:55:47	-4	-240	80,673.2	78,098.2	14.9	142.8	5.567	-5.561	0.267	63.8	116.0	64.0	04.26	-15.4	29.4
	2006-266T15:54:42.80	23-Sep-06	15:55:47	-3	-180	60,659.4	58,084.4	15.7	143.5	5.569	-5.558	0.351	84.9	115.9	64.1	04.27	-15.4	30.3
	2006-266T16:54:42.80	23-Sep-06	16:55:47	-2	-120	40,654.4	38,079.4	17.5	144.1	5.579	-5.555	0.520	126.8	115.9	64.1	04.28	-15.4	31.3
	2006-266T17:54:42.80	23-Sep-06	17:55:47	-1	-60	20,690.7	18,115.7	22.6	144.1	5.615	-5.522	1.019	249.6	115.8	64.2	04.32	-15.4	32.2
	2006-266T18:24:42.80	23-Sep-06	18:25:47	-1	-30	10,855.8	8,280.8	32.1	142.6	5.685	-5.343	1.942	479.0	114.8	65.2	04.40	-15.4	32.7
	2006-266T18:39:42.80	23-Sep-06	18:40:47	0	-15	6,251.5	3,676.5	48.0	138.4	5.791	-4.708	3.372	849.1	111.7	68.3	04.58	-15.4	32.9
	2006-266T18:49:42.80	23-Sep-06	18:50:47	0	-5	3,925.6	1,350.6	76.2	107.7	5.936	-2.531	5.369	1430.9	101.4	78.6	07.01	-15.4	33.1
T18_29TI	**2006-266T18:54:42.80**	**23-Sep-06**	**18:55:47**	**0**	**0**	**3,525.0**	**950.0**	**71.0**	**-3.2**	**5.979**	**0.000**	**5.979**	**1638.1**	**89.9**	**90.1**	**14.25**	**-15.4**	**33.1**
	2006-266T18:59:42.80	23-Sep-06	19:00:47	0	5	3,925.5	1,350.5	45.4	-21.6	5.936	2.530	5.369	1430.9	78.4	101.6	15.39	-15.4	33.2
	2006-266T19:09:42.80	23-Sep-06	19:10:47	0	15	6,251.4	3,676.4	15.1	-28.4	5.791	4.708	3.372	849.1	68.2	111.8	16.06	-15.4	33.4
	2006-266T19:24:42.80	23-Sep-06	19:25:47	1	30	10,855.8	8,280.8	-0.9	-30.8	5.685	5.343	1.942	479.0	65.1	114.9	16.17	-15.4	33.6
	2006-266T19:54:42.80	23-Sep-06	19:55:47	1	60	20,691.3	18,116.3	-10.5	-31.9	5.616	5.523	1.018	249.5	64.2	115.8	16.23	-15.4	34.1
	2006-266T20:54:42.80	23-Sep-06	20:55:47	2	120	40,657.1	38,082.1	-15.6	-31.8	5.580	5.556	0.517	126.8	64.1	115.9	16.27	-15.4	35.0
	2006-266T21:54:42.80	23-Sep-06	21:55:47	3	180	60,665.7	58,090.7	-17.3	-31.1	5.570	5.560	0.344	84.9	64.0	116.0	16.28	-15.4	36.0
	2006-266T22:54:42.80	23-Sep-06	22:55:47	4	240	80,685.4	78,110.4	-18.2	-30.3	5.569	5.563	0.255	63.8	64.0	116.0	16.28	-15.4	36.9
	2006-266T23:54:42.80	23-Sep-06	23:55:47	5	300	100,719.7	98,144.7	-18.7	-29.4	5.571	5.568	0.199	51.1	64.0	116.0	16.29	-15.4	37.8
	2006-267T00:54:42.80	24-Sep-06	00:55:47	6	360	120,775.6	118,200.6	-19.0	-28.5	5.577	5.575	0.159	42.6	64.0	116.0	16.29	-15.4	38.8
	2006-267T02:54:42.80	24-Sep-06	02:55:47	8	480	160,984.4	158,409.4	-19.4	-26.6	5.597	5.596	0.106	32.0	63.9	116.1	16.29	-15.4	40.7
	2006-267T04:54:42.80	24-Sep-06	04:55:47	10	600	201,380.1	198,805.1	-19.6	-24.7	5.627	5.627	0.076	25.6	63.8	116.2	16.28	-15.4	42.5
	2006-267T06:54:42.80	24-Sep-06	06:55:47	12	720	242,039.9	239,464.9	-19.7	-22.7	5.670	5.670	0.080	21.3	63.7	116.3	16.28	-15.4	44.4
	2006-267T08:54:42.80	24-Sep-06	08:55:47	14	840	283,053.1	280,478.1	-19.7	-20.6	5.727	5.725	0.115	18.2	63.5	116.4	16.27	-15.4	46.3
	2006-267T10:54:42.80	24-Sep-06	10:55:47	16	960	324,524.1	321,949.1	-19.6	-18.5	5.800	5.797	0.170	15.9	63.4	116.6	16.26	-15.4	48.2
	2006-267T12:54:42.80	24-Sep-06	12:55:47	18	1080	366,576.6	364,001.6	-19.5	-16.4	5.892	5.887	0.237	14.0	63.2	116.8	16.25	-15.4	50.0
	2006-267T14:54:42.80	24-Sep-06	14:55:47	20	1200	409,357.1	406,782.1	-19.3	-14.3	6.008	6.000	0.318	12.6	63.0	117.0	16.24	-15.4	51.9
	2006-267T18:54:42.80	24-Sep-06	18:55:47	24	1440	497,837.6	495,262.6	-18.8	-10.0	6.332	6.310	0.525	10.3	62.5	117.5	16.22	-15.4	55.7

1.5 PLAYBACK TIMELINE

029TI (T18) Playback Timeline **Created August 25, 2006**

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Record Start Time Reference Epoch (ddThh:m	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	~Latest Estimate	Best Estimate	~Latest Estimate
CAPS_029SA_SURVEY001_RIDER	CAPS_16000	2006-265T20:07:00	-00T22:52	24-Sep Sun 11:57 A	Sun 11:57 AM	24-Sep Sun 04:57 AM	Sun 04:57 AM
INMS_029OT_MAGTAIL002_CAPS	INMS_1498	2006-265T20:07:00	-00T22:52	24-Sep Sun 11:57 A	Sun 11:57 AM	24-Sep Sun 04:57 A	Sun 04:57 AM
RPWS_029OT_MAGTAIL003_CAPS	RPWS_30464	2006-265T20:07:00	-00T22:52	24-Sep Sun 11:57 A	Sun 11:57 AM	24-Sep Sun 04:57 AM	Sun 04:57 AM
CIRS_029TI_MIDIRTMAP004_PRIME	CIRS_4000	2006-265T20:58:49	-00T22:00	24-Sep Sun 12:03 P	Sun 12:03 PM	24-Sep Sun 05:03 AM	Sun 05:03 AM
CIRS_029TI_MIDIRTMAP004_SI	ISS_SUPPORT_IMAGI	2006-265T20:58:49	-00T22:00	24-Sep Sun 12:03 P	Sun 12:03 PM	24-Sep Sun 05:03 AM	Sun 05:03 AM
ISS_029TI_MIDIRTMAP004_CIRS	ISS_Phot_1_by_1	2006-265T20:58:49	-00T22:00	24-Sep Sun 12:03 P	Sun 12:03 PM	24-Sep Sun 05:03 A	Sun 05:03 AM
VIMS_029TI_COMPMAP003_CIRS	VIMS_18432	2006-265T22:28:49	-00T20:30	24-Sep Sun 12:15 P	Sun 12:17 PM	24-Sep Sun 05:15 A	Sun 05:17 AM
INMS_029SA_SURVEY001_RIDER	INMS_1498	2006-266T02:05:04	-00T16:53	24-Sep Sun 12:46 P	Sun 12:51 PM	24-Sep Sun 05:46 A	Sun 05:51 AM
MAG_029OT_SURVEY001_PRIME	MAG_1976	2006-266T02:05:04	-00T16:53	24-Sep Sun 12:46 P	Sun 12:51 PM	24-Sep Sun 05:46 AM	Sun 05:51 AM
MIMI_029CO_SURVEY001_RIDER	MIMI_8000	2006-266T02:05:04	-00T16:53	24-Sep Sun 12:46 P	Sun 12:51 PM	24-Sep Sun 05:46 A	Sun 05:51 AM
RPWS_029SA_OUTSURVEY001_PRI	RPWS_30464	2006-266T02:05:04	-00T16:53	24-Sep Sun 12:46 P	Sun 12:51 PM	24-Sep Sun 05:46 AM	Sun 05:51 AM
CIRS_029TI_FIRNADCMP006_ISS	CIRS_4000	2006-266T03:58:49	-00T15:00	24-Sep Sun 12:56 P	Sun 01:03 PM	24-Sep Sun 05:56 AM	Sun 06:03 AM
ISS_029TI_NIGHTNAC001_PRIME	ISS_Phot_1_by_1	2006-266T03:58:49	-00T15:00	24-Sep Sun 12:56 P	Sun 01:03 PM	24-Sep Sun 05:56 A	Sun 06:03 AM
VIMS_029TI_GLOBMAP004_ISS	VIMS_18432	2006-266T03:58:49	-00T15:00	24-Sep Sun 12:56 P	Sun 01:03 PM	24-Sep Sun 05:56 A	Sun 06:03 AM
CIRS_029TI_FIRNADCMP003_PRIME	CIRS_4000	2006-266T04:58:49	-00T14:00	24-Sep Sun 01:08 P	Sun 01:17 PM	24-Sep Sun 06:08 AM	Sun 06:17 AM
CIRS_029TI_FIRNADCMP003_SI	ISS_SUPPORT_IMAGI	2006-266T04:58:49	-00T14:00	24-Sep Sun 01:08 P	Sun 01:17 PM	24-Sep Sun 06:08 AM	Sun 06:17 AM
ISS_029TI_FIRNADCMP003_CIRS	ISS_Phot_1_by_1	2006-266T04:58:49	-00T14:00	24-Sep Sun 01:08 P	Sun 01:17 PM	24-Sep Sun 06:08 A	Sun 06:17 AM
VIMS_029TI_COMPMAP004_CIRS	VIMS_18432	2006-266T04:58:49	-00T14:00	24-Sep Sun 01:08 P	Sun 01:17 PM	24-Sep Sun 06:08 A	Sun 06:17 AM
INMS_029TI_T18INBD001_PRIME	INMS_1498	2006-266T07:05:37	-00T11:53	24-Sep Sun 01:22 P	Sun 01:31 PM	24-Sep Sun 06:22 A	Sun 06:31 AM
CIRS_029TI_FIRNADCMP007_ISS	CIRS_4000	2006-266T10:28:49	-00T08:30	24-Sep Sun 01:41 P	Sun 01:53 PM	24-Sep Sun 06:41 AM	Sun 06:53 AM
ISS_029TI_PHOTOMWAC001_PRIME	ISS_Phot_1_by_1	2006-266T10:28:49	-00T08:30	24-Sep Sun 01:41 P	Sun 01:53 PM	24-Sep Sun 06:41 A	Sun 06:53 AM
VIMS_029TI_REGMAP004_ISS	VIMS_18432	2006-266T10:28:49	-00T08:30	24-Sep Sun 01:41 P	Sun 01:53 PM	24-Sep Sun 06:41 A	Sun 06:53 AM
CIRS_029TI_FIRNADMAP002_UVIS	CIRS_4000	2006-266T11:28:49	-00T07:30	24-Sep Sun 01:54 P	Sun 02:08 PM	24-Sep Sun 06:54 AM	Sun 07:08 AM
ISS_029TI_EUVFUV001_UVIS	ISS_Phot_1_by_1	2006-266T11:28:49	-00T07:30	24-Sep Sun 01:54 P	Sun 02:08 PM	24-Sep Sun 06:54 A	Sun 07:08 AM
UVIS_029TI_EUVFUV001_PRIME	UVIS_5032	2006-266T11:28:49	-00T07:30	24-Sep Sun 01:54 P	Sun 02:08 PM	24-Sep Sun 06:54 AM	Sun 07:08 AM
VIMS_029TI_LIMBSCAN004_UVIS	VIMS_18432	2006-266T11:28:49	-00T07:30	24-Sep Sun 01:54 P	Sun 02:08 PM	24-Sep Sun 06:54 A	Sun 07:08 AM
CIRS_029TI_FIRNADCMP008_ISS	CIRS_4000	2006-266T15:58:49	-00T03:00	24-Sep Sun 02:26 P	Sun 02:46 PM	24-Sep Sun 07:26 AM	Sun 07:46 AM
ISS_029TI_NIGHTWAC001_PRIME	ISS_Phot_1_by_1	2006-266T15:58:49	-00T03:00	24-Sep Sun 02:26 P	Sun 02:46 PM	24-Sep Sun 07:26 A	Sun 07:46 AM
VIMS_029TI_REGMAP005_ISS	VIMS_18432	2006-266T15:58:49	-00T03:00	24-Sep Sun 02:26 P	Sun 02:46 PM	24-Sep Sun 07:26 A	Sun 07:46 AM
CAPS_029TI_T18INBND001_PRIME	CAPS_16000	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 AM	Sun 08:00 AM
CIRS_029TI_FIRLMBINT003_PRIME	CIRS_4000	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 AM	Sun 08:00 AM
CIRS_029TI_FIRLMBINT003_SI	ISS_SUPPORT_IMAGI	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 AM	Sun 08:00 AM
ISS_029TI_FIRLMBINT003_CIRS	ISS_Phot_1_by_1	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 A	Sun 08:00 AM
MAG_029TI_MAGTITAN001_PRIME	MAG_1976	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 AM	Sun 08:00 AM
MIMI_029TI_T18INBND002_CAPS	MIMI_8000	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 A	Sun 08:00 AM
RADAR_029OT_WARM4RAS001_RID	RADAR_364800	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 A	Sun 08:00 AM
RPWS_029TI_TIINTRMED001_PRIME	RPWS_30464	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 AM	Sun 08:00 AM
VIMS_029TI_LIMB004_CIRS	VIMS_18432	2006-266T16:58:49	-00T02:00	24-Sep Sun 02:39 P	Sun 03:00 PM	24-Sep Sun 07:39 A	Sun 08:00 AM
CAPS_029TI_T18CLOSE001_PRIME	CAPS_16000	2006-266T17:58:49	-00T01:00	24-Sep Sun 02:57 P	Sun 03:21 PM	24-Sep Sun 07:57 AM	Sun 08:21 AM
INMS_029TI_T18FULRT001_PRIME	INMS_1498	2006-266T17:58:49	-00T01:00	24-Sep Sun 02:57 P	Sun 03:21 PM	24-Sep Sun 07:57 A	Sun 08:21 AM
MIMI_029TI_T18CLOSE002_CAPS	MIMI_8000	2006-266T17:58:49	-00T01:00	24-Sep Sun 02:57 P	Sun 03:21 PM	24-Sep Sun 07:57 A	Sun 08:21 AM
CIRS_029TI_FIRLMBINT006_ENGR	CIRS_4000	2006-266T18:13:49	-00T00:45	24-Sep Sun 03:04 P	Sun 03:28 PM	24-Sep Sun 08:04 AM	Sun 08:28 AM
CIRS_029TI_FIRLMBINT006_SI	ISS_SUPPORT_IMAGI	2006-266T18:13:49	-00T00:45	24-Sep Sun 03:04 P	Sun 03:28 PM	24-Sep Sun 08:04 AM	Sun 08:28 AM
RPWS_029TI_TICA001_PRIME	RPWS_182784	2006-266T18:28:49	-00T00:30	24-Sep Sun 03:08 P	Sun 03:33 PM	24-Sep Sun 08:08 AM	Sun 08:33 AM

INMS_029TI_T18RMPNT001_PRIME	INMS_1498	2006-266T18:35:49	-00T00:23	24-Sep Sun 03:15 P	Sun 03:41 PM	24-Sep Sun 08:15 A	Sun 08:41 AM
RPWS_029TI_TICA002_PRIME	RPWS_182784	2006-266T18:48:49	-00T00:10	24-Sep Sun 03:28 P	Sun 03:54 PM	24-Sep Sun 08:28 A	Sun 08:54 AM
RADAR_029TI_T18RASAR001_INMS	RADAR_364800	2006-266T18:52:49	-00T00:06	24-Sep Sun 03:30 P	Sun 03:56 PM	24-Sep Sun 08:30 A	Sun 08:56 AM
RPWS_029TI_TICA003_PRIME	RPWS_182784	2006-266T19:08:49	00T00:09	24-Sep Sun 03:53 P	Sun 04:38 PM	24-Sep Sun 08:53 A	Sun 09:38 AM
CIRS_029TI_FIRLMBINT005_ENGR	CIRS_4000	2006-266T19:21:49	00T00:22	24-Sep Sun 04:05 P	Sun 04:52 PM	24-Sep Sun 09:05 A	Sun 09:52 AM
INMS_029TI_T18FULRT002_PRIME	INMS_1498	2006-266T19:21:49	00T00:22	24-Sep Sun 04:05 P	Sun 04:52 PM	24-Sep Sun 09:05 A	Sun 09:52 AM
VIMS_029TI_TRANSITIO006_ENGR	VIMS_18432	2006-266T19:21:49	00T00:22	24-Sep Sun 04:05 P	Sun 04:52 PM	24-Sep Sun 09:05 A	Sun 09:52 AM
RPWS_029TI_TIINTRMED002_PRIME	RPWS_30464	2006-266T19:26:49	00T00:27	24-Sep Sun 04:27 P	Sun 04:57 PM	24-Sep Sun 09:27 A	Sun 09:57 AM
VIMS_029TI_COMPMAP001_PRIME	VIMS_18432	2006-266T19:43:49	00T00:44	24-Sep Sun 04:34 P	Sun 05:05 PM	24-Sep Sun 09:34 A	Sun 10:05 AM
CIRS_029TI_FIRNADMAP003_VIMS	CIRS_4000	2006-266T19:45:49	00T00:46	24-Sep Sun 04:35 P	Sun 05:06 PM	24-Sep Sun 09:35 A	Sun 10:06 AM
ISS_029TI_COMPMAP001_VIMS	ISS_Phot_1_by_1	2006-266T19:45:49	00T00:46	24-Sep Sun 04:35 P	Sun 05:06 PM	24-Sep Sun 09:35 A	Sun 10:06 AM
CAPS_029TI_T18OUTBND001_PRIME	CAPS_16000	2006-266T19:58:49	00T00:59	24-Sep Sun 04:41 P	Sun 05:13 PM	24-Sep Sun 09:41 A	Sun 10:13 AM
INMS_029TI_T18OUTBD001_PRIME	INMS_1498	2006-266T19:58:49	00T00:59	24-Sep Sun 04:41 P	Sun 05:13 PM	24-Sep Sun 09:41 A	Sun 10:13 AM
MIMI_029TI_T18OUTBND002_CAPS	MIMI_8000	2006-266T19:58:49	00T00:59	24-Sep Sun 04:41 P	Sun 05:13 PM	24-Sep Sun 09:41 A	Sun 10:13 AM
CAPS_029SA_SURVEY002_RIDER	CAPS_16000	2006-266T20:58:49	00T01:59	24-Sep Sun 05:02 P	Sun 05:37 PM	24-Sep Sun 10:02 A	Sun 10:37 AM
MAG_029OT_SURVEY004_PRIME	MAG_1976	2006-266T20:58:49	00T01:59	24-Sep Sun 05:02 P	Sun 05:37 PM	24-Sep Sun 10:02 A	Sun 10:37 AM
MIMI_029CO_SURVEY002_RIDER	MIMI_8000	2006-266T20:58:49	00T01:59	24-Sep Sun 05:02 P	Sun 05:37 PM	24-Sep Sun 10:02 A	Sun 10:37 AM
CIRS_029TI_FIRNADCMP002_VIMS	CIRS_4000	2006-266T23:58:49	00T04:59	24-Sep Sun 05:42 P	Sun 06:23 PM	24-Sep Sun 10:42 A	Sun 11:23 AM
CDA_029RI_1802RINGM003_RIDER	CDA_524	2006-267T02:22:19	00T07:23	24-Sep Sun 06:16 P	Sun 07:02 PM	24-Sep Sun 11:16 A	Sun 12:02 PM
CDA_029DR_1203DUST164_RIDER	CDA_524	2006-267T04:23:19	00T09:24	24-Sep Sun 06:45 P	Sun 07:35 PM	24-Sep Sun 11:45 A	Sun 12:35 PM
VIMS_029TI_COMPMAP006_PRIME	VIMS_18432	2006-267T04:34:49	00T09:35	24-Sep Sun 06:48 P	Sun 07:39 PM	24-Sep Sun 11:48 A	Sun 12:39 PM
ISS_029TI_MONITOR001_PRIME	ISS_Phot_1_by_1	2006-267T04:51:49	00T09:52	24-Sep Sun 06:52 P	Sun 07:44 PM	24-Sep Sun 11:52 A	Sun 12:44 PM
INMS_029SA_MRO005_RIDER	INMS_1498	2006-267T06:52:44	00T11:53	24-Sep Sun 07:19 P	Sun 08:14 PM	24-Sep Sun 12:19 P	Sun 01:14 PM
INMS_029SA_SURVEY002_RIDER	INMS_1498	2006-267T07:25:44	00T12:26	24-Sep Sun 07:20 P	Sun 08:15 PM	24-Sep Sun 12:20 P	Sun 01:15 PM
CIRS_029RI_TEMPL10HP001_PRIME	CIRS_4000	2006-267T07:30:00	00T12:31	24-Sep Sun 07:21 P	Sun 08:15 PM	24-Sep Sun 12:21 P	Sun 01:15 PM
CIRS_029RI_TEMPL10HP001_SI	ISS_SUPPORT_IMAGI	2006-267T07:30:00	00T12:31	24-Sep Sun 07:21 P	Sun 08:15 PM	24-Sep Sun 12:21 P	Sun 01:15 PM
UVIS_029SW_IPHSURVEY017_RIDER	UVIS_5032	2006-267T10:30:00	00T15:31	24-Sep Sun 04:07 P	Sun 08:29 PM	24-Sep Sun 09:07 A	Sun 01:29 PM
CIRS_029IC_DSCAL1427_RIDER	CIRS_4000	2006-267T11:15:00	00T16:16	24-Sep Sun 04:09 P	Sun 04:09 PM	24-Sep Sun 09:09 A	Sun 09:09 AM
RPWS_029SA_INSURVEY001_PRIME	RPWS_30464	2006-267T14:25:00	00T19:26	24-Sep Sun 04:21 P	Sun 04:23 PM	24-Sep Sun 09:21 A	Sun 09:23 AM